

REMARKS

This is a full and timely response to the final Official Action mailed May 21, 2004 (Paper No. 6). Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested. Claims 1-14 and 16-44 are currently pending for further action.

With regard to the prior art, the final Office Action rejects claims 30-38 and 44 over the combined teachings of U.S. Patent No. 6,118,474 to Nayar ("Nayar") and U.S. Patent No. 6,611,282 to Trubko et al. Claims 39-43 were rejected over the combined teachings of Nayar and Trubko in combination with one or more other secondary references. For at least the following reasons, these rejections are respectfully traversed.

Trubko is specifically cited for the teaching of a hyperbolic mirror using in a panoramic imaging apparatus. Nayar does not teach or suggest a hyperbolic mirror, but instead refers to a "substantially paraboloid-shaped reflector." (*See*, Nayar, abstract).

However, Applicant wishes to point out that Trubko is *not* prior art as against the present application. Trubko claims priority to a provisional application filed January 4, 1999. The present application has a priority date of June 16, 1998.

The present application claims priority to two earlier applications: a provisional application filed March 30, 2000 and a utility application filed June 16, 1998. (*See*, Applicant's Spec., paragraph 0001). The present application was filed March 29, 2001. The prior utility

application was issued October 16, 2001 as U.S. Patent No. 6,304,285 and describes the use of hyperbolic mirrors in an omnidirectional imaging system.

Consequently, Trubko cannot be cited against the present application as prior art teaching a hyperbolic mirror in a panoramic imaging apparatus. For at least this reason, the rejections of claims 30-44 must be withdrawn.

The final Office Action also maintains a rejection of claims 1-6 and 14-23 as anticipated by Nayar. The other dependent claims were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Nayar and various other secondary references. For at least the following reasons, Applicant respectfully traverses these rejections.

Claim 14 recites:

An improved imaging apparatus for generating a two-dimensional image, comprising:

a reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene;

an image sensor responsive to said reflective mirror and that generates two dimensional image data signals to obtain an omnidirectional image on an image plane; and

a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.

Claim 1 recites similar subject matter in the form of a method claim. In contrast, Nayar fails to teach or suggest many of the features of claims 1 and 14.

For example, Applicant recites “a reflective mirror *configured to satisfy an optical single viewpoint constraint* for reflecting an image scene.” (emphasis added). While subject matter in the specification is not read into the claims, the terms used in the claims must still be read as defined in the specification. *Markman v. Westview Instruments*, 116 S. Ct. 1384 (1996); *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 888-89, 221 U.S.P.Q. 1025 (Fed. Cir. 1984) (The inventor may be his own lexicographer).

Applicant’s specification clearly defines the “single viewpoint constraint” as follows: “each pixel in the image corresponds to a particular viewing direction defined by a ray from that pixel on an image plane through a single viewing point such that all of the light rays are directed to a single virtual viewing point.” (Applicant’s Spec., para. 26). *The specification also clearly excludes conical, hemispherical and parabolic reflectors* (See Figs. 2a-2c) *from the definition of reflectors that satisfy this condition.* (Applicant’s Spec., para. 26).

In contrast, Nayar only teaches parabolic reflectors. (See Nayar, abstract). It cannot be said that Nayar teaches something other than a parabolic reflectors when Nayar clearly states that the reflectors discussed are “paraboloid-shaped reflector[s].” (See Nayar, abstract).

Consequently, Nayar teaches a reflector that is expressly defined in the Applicant’s specification as failing to satisfy the claimed “single viewpoint constraint.” Therefore, Nayar cannot teach or suggest the claimed “reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene.”

Applicant further recites “a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a

geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.” This subject matter is also not taught or suggested by Nayar.

According to the final Office Action, “this limitation simply says that there is a conversion that takes place from the coordinate system used by the Mirror, i.e., cylindrical, and the image plane or monitor, i.e., Cartesian.” (Paper No. 6, p. 2). This is clearly incorrect. Applicant is claiming a specific component, a “mapping matrix generator,” that electronically defines and implements a relationship between the image plane and the perspective viewing window. Nayar teaches no such component.

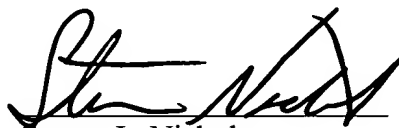
Nayar simply teaches a “one-to-one correspondence between the x-y coordinate of the point of intersection with the reflector 135 of the orthographically projected ray, and the x-y coordinate of the point at which that orthographically projected ray intersects the planar light-sensitive surface of the image sensor 110.” (Col. 10, lines 14-19). In other words, the reflector collimates light onto the image sensor as shown by Nayar in Fig. 1a.

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. As demonstrated, Nayar fails to teach or suggest the “reflective mirror configured to satisfy an optical single viewpoint constraint.” Nayar also fails to teach or suggest “a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric

relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.” Therefore, the rejection based on Nayar of claims 1-29 should be reconsidered and withdrawn.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If any fees are owed in connection with this paper which have not been elsewhere authorized, authorization is hereby given to charge those fees to Deposit Account 18-0013 in the name of Rader, Fishman & Grauer PLLC. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



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